# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/079,999 | 02/19/2002 | Yoichi Mizuno | 16869S-043800US | 7054 |

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| EXAMINER |
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| SHAH, SAUMIL R |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2186 | |

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/079,999 | MIZUNO ET AL. |
| | Examiner | Art Unit |
| | Saumil Shah | 2186 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>02/19/02</u> .

2a)☐ This action is **FINAL.**    2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-14</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-14</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)     4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)     5)☐ Notice of Informal Patent Application (PTO-152)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .     6)☐ Other: .

# DETAILED ACTION

## *Specification*

1.      The disclosure is objected to because of the following informalities:

The use of the phrase "capable of recognized" in page 11, line 20 is not

grammatically correct.

Appropriate correction is required.

## *Claim Rejections - 35 USC § 112*

2.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

3.      Claim 1 recites the limitation "said controller" in line 6.  However, there are a

"plurality of controllers" mentioned in the line 4. It is unclear as to which controller is

being described and so there is insufficient antecedent basis for this limitation in the

claim.

## *Claim Rejections - 35 USC § 102*

4.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public
> use or on sale in this country, more than one year prior to the date of application for patent in the United
> States.

5.      Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by

DeKoning et al (US Patent No 6073218).

With regard to claim 1, DeKoning et al disclose a disk array system having at least one computer and a disk array apparatus having a plurality of disk apparatuses (note column 7, lines 43-48) and a plurality of controllers each having a dedicated cache (note column 8, lines 14-18), wherein:

said controller comprises configuration management means for managing configuration information of logical units formed for the disk apparatus (note column 12, lines 5-9), said configuration information means rewrites the configuration information of the logical units in accordance with control information to perform a take-over process of switching a desired logical unit or units under control of one controller to another desired controller or controllers (note column 13, lines 14-30 where it is implied that when another controller takes over as primary for a failed primary controller, it undergoes a similar process of initialization/ reconfiguration as is described for a controller becoming a primary controller during initialization. It can further be seen from column 12, lines 5-9 that the information contains configuration information for the LUNs that it is in charge of. Also, in the same context, it can be claimed that a "take-over" process is the same as a temporary exclusive access to LUN by a controller. With respect to that interpretation, column 12, lines 5-9 and lines 37-40 indicate that the configuration information is changed in accordance with control information for a "take-over" process).

With regard to claim 2, DeKoning et al disclose a disk array system according to claim 1, wherein said configuration management means designates

a subject logical unit and a switch-designation unit controller in response to
information of designating migration of logical units between the controllers (note
column 9, lines 19-24 where it can be interpreted that the passive RDAC is
designated as the switch-destination unit controller with respect to a particular
LUN for which the primary controller was in charge of).

With regard to claim 3, DeKoning et al disclose a disk array system
according to claim 1, wherein a connection port number of a switch-destination
controller or a logical unit number of a logical unit to be recognized by the
computer is changed in response to information of designating migration of
logical units between the controllers (note , column 13, lines 19-33 where a
primary initializes tables based on the LUNs it is in charge of. Also, note that
another controller assumes the role of the primary if the primary fails. It can
therefore be claimed that the same process of table initialization would follow
reassignment of control in case the primary fails and thus the logical unit number
would have to change (added to new controller tables) in order to transfer control
to the "spare" controller).

With regard to claims 4 and 5, DeKoning et al disclose a disk array system
according to claim1, wherein a switch-source controller write data of a subject
logical unit on the cache into the disk in response to information of designating
migration of logical units between the controllers. DeKoning et al further disclose
that a write instruction command was contained in the control information (note

column 17, lines 35-50 where a request for a cache flush to the disk drive could be scheduled at the instant of the take-over).

With regard to claim 6, DeKoning et al disclose a disk array system according to claim 1, wherein said configuration management means performs a logical unit automatic take-over by storing information of a switch-destination controller (note column 12, lines 37-40 where it has been interpreted as in claim 1 that a temporary exclusive access is analogous to a "take-over" and so the semaphore includes the information about the access requesting controller).

With regard to claims 7 and 8, DeKoning et al teach everything as is mentioned in claims 1 and 2 above.

6.      Claims 9, 10, 12, 13, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Idleman et al (US Patent No. 5140592).

With regard to claim 9, Idleman et al disclose a disk apparatus to be used by at east one external computer, the disk array apparatus having a plurality of controllers each having a dedicated cache and a plurality of disk apparatuses connectable to the controllers (note column 8, lines 1-2 and 6-9), wherein:

each of the plurality of controllers includes configuration management means for managing configuration information of logical units formed in the disk apparatus (note column 35, lines 7-19 where the configuration management is done by programs running on the processors in the controllers), and said configuration management means includes migrating means having a function of changing the configuration of the logical unit in accordance with

control information (note column 40, lines 39-41 where it is implied that using the configuration utility, control signal can be generated so as to change the configuration of the logical unit), and said migrating means migrates a desired logical unit under control of one controller to another desired controller in accordance with the configuration information of the changed configuration (note column 15, lines 46-54 where it can be claimed that the configuration information causes the controller to load various registers to reconfigure the connections according to new configuration).

With regard to claim 10, Idleman et al disclose a disk array apparatus according to claim 9, wherein said configuration management means includes a rewritable configuration table for registering a switch-source and a switch-destination of each logical unit in accordance with the control information (note column 36, lines 9-14 and column 38, lines 35-39 where the configuration information is stored in both the controllers), and said configuration management means reconfigures the logical unit configuration of its own controller in accordance with the configuration information in said configuration table (column 35, lines 16-19).

With regard to claim 12, Idleman et al disclose a disk array apparatus according to claim 9, wherein the disk array apparatus generates the control information and supplies the control information to said configuration management means (note column 10, lines 45-48 where the controller is a part

of the disk array apparatus and it generates a message telling the other controller

that it is shutting down. The message can be claimed to be control information).

With regard to claim 13, Idleman et al disclose a disk array according to

claim 9, wherein the control information contains information of designating a

switch-source controller managing a logical unit to be migrated and a switch-

destination controller (note column 10, lines 45-51 where it is obvious that the

message sent to the other controller makes the sending controller the switch-

source controller and the receiving controller, the switch-destination controller).

With regard to claim 14, Idleman et al disclose a disk array apparatus

according to claim 9, wherein at least one of the plurality of controllers has a

backup function (note figure 1 and column 16, lines 9-14 where the ACC is within

the ECC module shown in Figure 4 and column 22, lines 21-26 where the backup

function is performed by the ACC and other disks) and a function of becoming a

switch-destination of a logical unit under management by another controller (note

column 10, lines 45-51 where it is obvious that the message sent to the other

controller makes the sending controller the switch-source controller and the

receiving controller, the switch-destination controller).

### Claim Rejections - 35 USC § 103

7.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.      Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning

et al (US Patent No. 6073218) in view of Murotani et al (US Patent No. 6412078).

        With regard to claim 3, DeKoning et al disclose everything as is mentioned

in claim 1 above. Murotani et al further teach a disk array system wherein a

connection port number of a switch-destination controller or a logical unit number

of a logical unit to be recognized by the computer is changed in response to

information of designating migration of logical units between the controllers (note

abstract, lines 3-12 where the SCSI port is changed in response to migration of

control).

        Hence, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have changed the connection port number of a

switch-destination controller as taught by Murotani et al in the system of

DeKoning et al since that would effectively change control of a LUN from one

controller to another.

9.      Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idleman

et al (US Patent No. 5140592) in view of Obara et al (US Patent No. 6625691).

        With regard to claim 11, Idleman et al disclose everything as is mentioned

in claim 9 above. Obara et al further teach a disk array apparatus wherein a disk

array system including the disk array apparatus and the external computer

includes a system management unit, and the system management system

generates the control information and supplies the control information to the disk

array apparatus (note figures 1 and 11 where the system management unit is

taught by the channel path controller. Further note column 9, lines 6-10 where

the volume reallocation control processor generates the control information to

reallocate the volumes and supplies the information to the disk controllers).

Hence it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have added a system management unit as taught

by Obara et al to the system of Idleman et al for the purpose of generating

control information and supplying it to the disk array apparatus, since the system

manager would then be able to control the reallocation of LUN(s) from one

controller to another in a centralized manner such that the combination would

have all of the well known benefits (i.e., reduced hardware requirements) of

control centralization.

10.    Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Saumil Shah whose telephone number is 703-305-8786.

The examiner can normally be reached on 9:00 AM to 5:30 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matt Kim can be reached on 703-305-3821.  The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

Saumil Shah
Patent Examiner
Art Unit 2186

November 03, 2003

BEHZAD JAMES PEIKARI
PRIMARY EXAMINER